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December 27, 1958

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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

## Spring Song Soon

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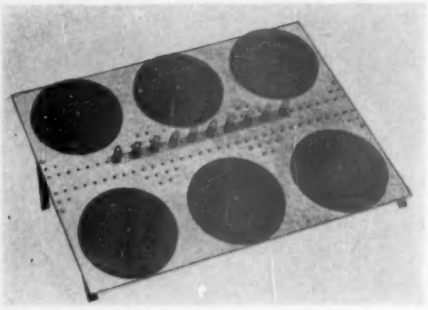

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ASTRONOMY

# Study Galaxies by Color

**Photoelectric observations in eight colors of the galaxies are providing scientists with a new method for studying the rate at which galaxies are receding.**

➤ A NEW METHOD for studying the rate at which a very far distant galaxy is rushing away from the solar system and all other galaxies has been developed.

Carnegie Institution of Washington, in its annual report, said the method is based on photoelectric observations of each galaxy in eight colors. It was developed by Dr. William A. Baum of Mt. Wilson and Palomar Observatories, which is operated jointly by Carnegie and the California Institute of Technology, using the giant 200-inch telescope atop Mt. Palomar.

From the eight-color photographs, Dr. Baum reduces the information to show the energy radiated by the galaxy as a function of wavelengths of light. Galaxies are clusters of uncounted billions of stars. The Milky Way, in which the sun, earth and other planets are located, is only one of the millions of galaxies that can be found in the universe.

Each galaxy seems to be rushing away from every other galaxy at a rate that increases with distance, except that the rate appears to slow down at the extreme edge of the observable universe. The rate of recession is measured by the shift in the galaxy's light toward the red end of the spectrum. Known as the redshift, this is equivalent for light to the lowering in pitch of a train whistle as a train recedes from the hearer.

The phenomenon is also known as the Doppler shift.

For a galaxy having a redshift, Dr. Baum has found that the entire energy-distribution curve he plotted by eight-color photometry is also shifted toward longer wavelengths. The eight-color photoelectric observations also provide a direct measure of the magnitudes of the remote galaxies.

Dr. Baum's method allows determination of the redshifts for galaxies considerably beyond the range that can be reached with the spectrograph. This is because the displacement of the energy-distribution curve for a distant galaxy compared to that of a relatively nearby galaxy is a measure of the distant galaxy's redshift.

Redshifts as large as four-tenths of the speed of light, or nearly 75,000 miles a second, have been found. This is nearly double the largest definite redshift obtainable from spectroscopic observations.

Dr. Baum concludes that the limiting factor for observing the universe with the 200-inch Hale telescope may well be the redshift of the light from the distant galaxy into the far infrared, where photographic plates are no longer sensitive, where absorption of the light by the earth's atmosphere is large and "night-sky" radiation is strong. Previously, astronomers have thought the falling off of light because of increasing distance was the limiting factor to the distance to which the Hale telescope could observe.

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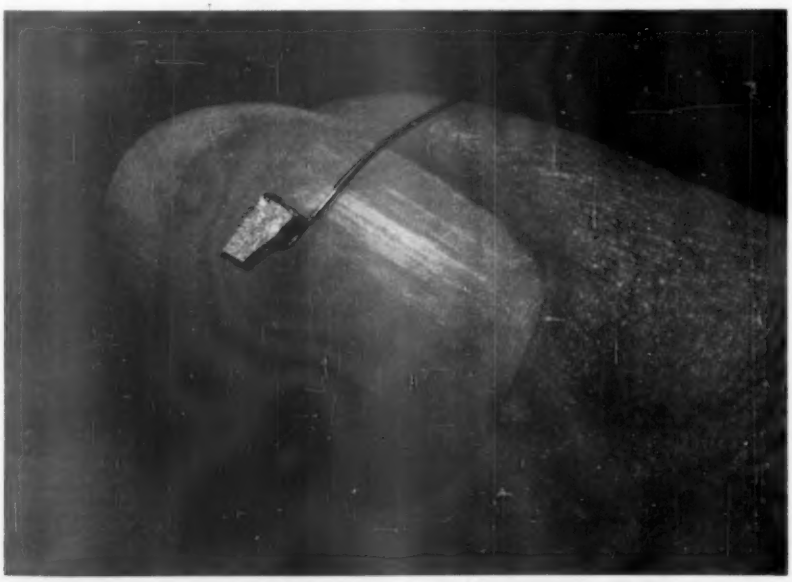

*NEUTRON "DETECTIVE"—A neutron detector consisting of a piece of germanium or silicon with approximately a millionth of an ounce of uranium-235 on its surface counts the electrical pulses emitted in the splitting of uranium atoms by neutrons. Function of the detector, developed by Westinghouse scientists, is to map the pattern of neutrons inside the intricate core of a nuclear reactor or "atomic furnace," thus permitting improved reactor design.*

ASTRONOMY

## Milky Way Found Part of Supercluster of Galaxies

➤ THE MILKY WAY in which the sun, and the earth and other planets are located is part of a supercluster of local galaxies, a United States astronomer reports.

Dr. Gerard de Vaucouleurs of Harvard College Observatory, Cambridge, Mass., says this super-system of galaxies is composed of an irregular assembly of galaxies, clouds and clusters dominated by the Virgo cluster at its center.

Lowest on the rung of this new astronomical hierarchy are the stars, of which the sun is the best known example. Billions of stars are grouped into congregations known as galaxies, one of which is the gigantic pinwheel of stars called the Milky Way.

Galaxies are the second rung.

Grouped about the Milky Way is the local cluster of galaxies, including the two Magellanic clouds. Such a cluster is the third rung.

Next highest are the clusters of clusters of galaxies, the fourth rung in the astronomical hierarchy suggested by Dr. de Vaucouleurs.

They are also known as second-order clusters, and average some hundred million light years across and billions of light years away from the local supercluster, the Milky Way. A light year is the distance covered in one year by light traveling at 186,000 miles per second.

The local supercluster that includes the Milky Way has a total mass a million billion times that of the sun, Dr. de Vaucouleurs has calculated.

His theory concerning the existence of second-order clusters of galaxies is based on a general catalogue of the radial velocities of galaxies from studies at Lick Observatory and Mt. Wilson and Palomar Observatories in California by Drs. M. L. Humason, N. U. Mayall and A. R. Sandage.

Dr. G. O. Abell, astronomy professor at the University of California at Los Angeles, will report in a forthcoming issue of the *Publication of the Astronomical Society of the Pacific* his estimates of the average size of some distant superclusters. These agree well with the estimated diameter of the local supercluster, Dr. de Vaucouleurs reports in *Nature* (Nov. 29).

Some astronomers have questioned the existence of the groups of galaxy clusters. More detailed counts of galaxies and their distribution in space are now underway to settle the question.

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# SCIENTIA INTERNATIONAL

## NOVAS DEL MENSE IN INTERLINGUA

➤ **Technologia Medical.**—Le Corporation Electric Westinghouse reporta progresso in le disveloppamento de un lampa ultraviolette capace a producer un forte ionisation negative del aere. Le projecto de disveloppar un tal lampa esseva inspirate per le observation practic que ionisation negative del aere allevia asthma, febre de feno, sinusitis, mal de capite, e mesmo rheumatismo e arthritis. Il pare etiam que ionisation negative promove le sensation de ben-esser general de personas qui non suffre de ulle condition pathologic. Ionisation positive ha effectos contrari. Nulle explication de iste observationes ha essite trovate. Le facto que lampas ultraviolette allevia febre de feno es ben cognoscite. Tamen, le theoria, frequentemente audite, que le ozon producite per tal lampas destrue le pathogenos in le aere non pare esser tenibile. Le factor active es plus probabilemente le iones negative.

➤ **Recercas De Cancere.**—Recercatores american ha colligite milles e milles de punctas de cigarrettas in le stratas de New York, Chicago, Pittsburgh, e Los Angeles pro determinar qual portion del cigarrettas comprate per le publico es vermente fumate e qual parte dispare in le cloacas. Esseva constatate que le fumatores american disjice 40 pro cento de lor cigarrettas in le forma de punctas non fumate. Un simile studio in Hollanda ha demonstrate que le hollandeses disjice solmente 25 pro cento de lor cigarrettas. Tal datos es importante pro le correlation inter cancere pulmonar e le consumption de cigarrettas. Per exemplo: le incidentia de cancere pulmonar in Anglaterra es plus alte que in le Statos Unite, sed le consumption de cigarrettas es plus basse. Nunc, si le angleses fuma como le hollandeses, lor ver consumption de tabaco in cigarrettas suffice pro explicar lor alte incidentia de cancere pulmonar; sed si illes fuma como le americanos, le incrimination de cigarrettas in le causation de cancere pulmonar deveni multo minus forte. Un programma de colliger e mesurar punctas de cigarrettas in le stratas de plure citates in Anglaterra ha essite initiate.

➤ **Recercas De Poliomyelitis.**—Dr. H. Koprowski, director del Instituto Wistar in Philadelphia, reporta que un vaccino antipoliomyelitic que contine virus vive sed attenuate se ha provate plus efficace e plus practic que le vaccino de Salk que contine le virus in forma non attenulate sed morte. Le vaccino a virus vive pote esser ingerite in le forma de pillulas e require nulle complexe technicas de sterilisation. Illo ha essite tentate in 275.000 subjectos, e nulle de istes ha contrahite poliomyelitis. Le subjectos usate in iste programma de vaccination experimental esseva habitantes del Statos Unite e del Congo Belge.

➤ **Atomos Pro Le Pace.**—Le prime precio "Atomos pro Pace" esseva accordate in 1957 a *Dr. Niels Bohr. Le secunde va honorar Dr.* G. C. de Hevesy de Stockholm qui es le initiator del utilisation de isotopos radioactive in investigationes biologic. Dr. de Hevesy esseva seligite unanimemente per le committee executive del precio, ben que 111 candidatos habeva essite proponite. A parte le honor e un medalia de auro, le precio vale $75.000. Illo esseva establite pro honorar le memoria de Henry e Edsel Ford. Su establimento esseva un responsa al appello de Presidente Eisenhower, in Geneva in 1955, in favor de effortios international pro le utilisation pacibile del energias atomic. Dr. de Hevesy es accostumate a reciper precios. In 1943, ille esseva honorate per le precio Nobel pro chimia.

➤ **Automobilismo.**—In Anglaterra on ha perfectionate un signal de traffico equipate a prolongar automaticamente—i.e. electronicamente—le duration del lumine verde usque a un certe maximo, pro assecurar que un vehiculo que crucia un strata non es surprendite per un cambiamento de signal ante que illo ha arrivate al altere latere.

➤ **Recercas De Cancere.**—Un gruppo de recercatores medical de Texas signala in un reporto in le jornal *Cancere* que le presentia de arsenico in tabaco merita plus attention como factor possibile in le correlation inter consumption de tabaco e incidentia de cancere pulmonar. Le arsenico in tabaco es contribuite per insecticidas. In un numero de essayos su concentration in tabaco commercial esseva 17 vices plus alte que le maximo tolerate in alimentos secundo le leges statounitese.

➤ **Hypertension.**—Studios reportate al Symposio Super Hypertension al Collegio Medical Hahnemann a Philadelphia indica que le norma del tension de sanguine in populos oriental es plus basse que in populos occidental. On crede que factores hereditari plus tosto que dietari o alteremente social es responsabile pro le differentia. Le incidentia de hypertension, del altere latere, pare essar plus alte in le Oriente que in le Occidente. Esseva etiam reportate que apoplexia es le plus importante causa de morte in Japon. Su incidentia in Japon es 100 pro cento plus alte que in le Statos Unite.

➤ **Medicina General.**—Un masca chirurgic ex plastico, multo plus efficace que mascas de gaza sed equalmente comfortabile, ha essite perfectionate e es preste a esser lanceate al mercato. Le creator del nove masca reporta tests indicante que mascas conventional lassa passar 145 colonias bacterial intra 5 minutas. Le correspondente cifra pro le nove masca es 1,2 colonias. Previe essayos de utilisar plastico in le fabrication de mascas chirurgic non ha succedite, apparentemente proque insufficiente attention esseva prestate al factor que tal mascas debe esser confrortabile pro le portator. Le importantia de iste aspecto deveni clar si on considera que chirurgos passa frequentemente sex a octo horas al tabula de operation. Evidentemente illes non pote tolerar que un masca disconfortabile disrumpe lor concentrate attention chirurgic.

➤ **Psychiatria.**—Dr. R. H. Klein, in su capacitate de functionario del Association American de Psychiatria, ha visitate le grande hospital psychiatric Kashenko a Moscova. In su reporto ille nota le excellentissime servicios nosocomial a Kashenko e adde le admission que ille esseva satis suprendite de trovar un tal institution, dedicate a promover—in spirito humanitari—le ben-esser de esseres sin valor social in le senso material, "sub un governamento que es (secundo le conception conventional del americanos) sin interesse in le individuo excepte in tanto que ille pote servir le stato."

➤ **Architectura.**—Le tecto del refectorio del nove academia de cadettos del statounitese marina ha un peso de plus que mille tonnas e forma un arco libere de plus que septanta metros de extension. Iste cifras es impressionante sed non extraordinari. Sed un aspecto extraordinari del cosa es que iste tecto esseva fundite de beton super un modulo formate de terra, i.e., un specie de collina artificial. Quando le beton se habeva solidificate, le collina esseva excavate, e alora le tecto complete esseva altiate super su prefabricate columnas de supporto per medio de levatores hydraulic.

Science News Letter, December 27, 1958

GENERAL SCIENCE

## Reading Interlingua

➤ YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you had never had contact with any foreign language.

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ROCKETS AND MISSILES

# Launch Four-Ton "Moon"

➤ THE U. S. AIR FORCE launched an 85-foot-long Atlas intercontinental ballistic missile (ICBM) weighing about 8,800 pounds into an earth-circling orbit from Cape Canaveral, Fla., on Dec. 18.

President Eisenhower said the launching constitutes "a distinct step forward in space operations," and opens "new opportunities to the U. S. and all mankind for activities in outer space."

Preliminary data indicated the satellite was orbiting the earth once every 100 minutes, reaching an apogee of 928 miles and a perigee of 114 miles. Because this orbit is relatively low and the atmosphere's drag on the object is therefore greater than on more distant orbits, the satellite is expected to stay up only about 20 days.

The satellite carried in its cylindrical body a communications system designed to record messages from ground stations and play them back on demand. It is called "Score" for "satellite communications orbit relay experiment."

The Air Force Atlas missile was launched to test its satellite vehicle launching capability. So successful was the test that the entire vehicle achieved an orbit. It was the first time that a high accuracy missile guidance system was used to steer a satellite into precisely the orbit path planned. Previous satellites have been hurled rather than guided into orbit.

It will be visible near dawn and dusk to persons living in a belt 32 degrees north or south of the equator.

The Atlas missile has three rocket engines totaling about 350,000 pounds of thrust. The payload of instruments weighs about 150 pounds, of which equipment for the communications experiment takes about 35.

Planning and implementation of the project were carried out by the Air Force ballistic missile division of the Air Research and Development Command in collaboration with the Army Signal Corp. Assisting were the Atlas ICBM technical team consisting of the Space Technology Laboratory, contractors to the Air Force for technical direction and system engineering; Convair Astronautics, builder of the Atlas missile; General Electric Co., Syracuse; and Burroughs Corp., developers of the accurate guidance systems; and Rocketdyne, division of North American Aviation, developer of the Atlas propulsion system.

Total weight of Sputnik II and its carrier rocket, which orbited as separate objects, has been estimated at about 7,000 pounds. Sputnik III and its carrier are believed to have weighed even more. Atlas' payload and carrier are one unit, with some of the payload housed in the carrier.

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PHYSIOLOGY

# Study Cholesterol Effects

➤ ATHEROSCLEROSIS can occur even in an artificial blood vessel following a high cholesterol diet, three scientists report.

Nylon and orlon fabric tubes were used to replace pieces of blood vessels.

This is believed to be the first time scientists have been able to make such a change in artificial blood vessel grafts.

Working with adult dogs, the scientists removed a section of the aorta and replaced it with about an inch of either nylon or orlon tubing. Approximately two weeks after the operation the dogs were placed on a diet of horse meat, a dog food preparation and five percent cholesterol.

The six animals studied were kept on the high cholesterol diet for 15, 18, 28, 58, 60 and 62 weeks respectively, the scientists report in the *Proceedings of the Society for Experimental Biology and Medicine* (Nov.).

In two animals kept on the diet for 60 weeks and 57 weeks, atheromatous changes developed in the inside surface of the graft. None of these changes affected the usefulness of the nylon or orlon, however.

Scattered yellow plaques slightly raised from the surface appeared on the newly formed connective tissue encasing the nylon. Large foam cells, associated with lipid or fat deposit, were also found.

These changes do not occur unless the animal goes through a long period of taking in large amounts of cholesterol, the scientists said. The synthetic blood vessel is also less susceptible to the changes than is normal blood vessel.

The discovery is expected to "shed some light on the mechanism by which such changes occur," the scientists conclude. Already it has lent support to the filtration concept of atherosclerosis in which the capillaries and blood plasma play a role in depositing lipid substances.

An "inherent metabolic or enzymatic capacity of the normal tissues of the vessel wall to form atheroma" does not seem to be essential to atherosclerosis.

Drs. George L. Jordan Jr. and Michael E. DeBakey of Baylor University College of Medicine and Bela Halpert of the Veterans Administration Hospital, Houston, Texas, who reported the research, say further studies using less porous synthetics for the blood vessel grafts are being made.

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MEDICINE

## X-Irradiated Mice Studied for Anemia

➤ A "STRIKING RELATION" between a decrease in the number of red blood cells and the amount of total liver fats in rats and mice is reported by a Czechoslovakian scientist.

When the animals are given high doses of X-irradiation there is usually damage to the liver in the form of fat degeneration, Dr. M. Skalka of the department of biophysics, Czechoslovak Academy of Sciences, explains. Severe anemia may also result.

Now a statistically highly significant correlation has been found between the two, the scientist reports in *Nature* (Dec. 6).

It is known, he says, that severe anemia and the resulting lack of oxygen in the organs causes damage to the liver. However, the relationship "as far as we know" has not been investigated in the case of irradiation effects.

There are indications that severe hypoxia (oxygen shortage) of the tissue "after irradiation is malignant to the organism," Dr. Skalka concludes.

Two other Czechoslovak researchers, M. Pospisil and L. Novak of the Biophysical Institute, also reported on studies of X-irradiated mice.

They have found that a mouse's consumption of oxygen under conditions of adapting to new environment is reduced before death due to irradiation. Interpreting this reduction as due to the nervous system's failure in its capacity for adaptation, the scientists fed the mice thyroid before irradiation.

For 20 days, male mice were given dried thyroid daily along with their food. Five days after this pre-treatment was stopped the animals were given a dose of whole-body X-irradiation of 600 roentgens.

Mortality for one untreated group was 70% at 30 days, the scientists reported; the treated mice had a mortality of 55%. In a second group, the untreated mice suffered 91% mortality, while those mice receiving the thyroid pre-treatment had only a 40% mortality.

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*PARTICLE TRAP—A filter mat, designed for collecting radioactive particles in the atmosphere for subsequent measurement, has been developed at Stanford Research Institute. It is built up by spraying a special solution of polystyrene in methylene chloride solvent against a square of Dacron mesh.*

MATHEMATICS

# Math Aids Missile Shoots

➤ THE "MONTE CARLO" method is being used to calculate the impact point of missiles, Dr. W. F. Bauer of the Space Technology Laboratories, Los Angeles, reports.

The Monte Carlo method is an advanced mathematical version of what is known as the "drunken walk problem." The drunken walk problem is so called because, using the simple rule that every step of an inebriate is as likely to be a step backwards as a step forward, a random, or unpredictable, path can be obtained.

In the Monte Carlo method, a mathematical game of chance more complicated than a drunken walk is devised. Reason for the game is to produce a random variable with an expected value that will be the solution of a certain problem. Thus the method is a way of solving physical problems using a series of statistical experiments that are performed by applying mathematical operations to random numbers.

Calculations involved in solving problems by the Monte Carlo method are so complicated that electronic computers are used to do the job in most instances.

One of the early applications of the technique was in solving the problem of how far neutrons in a nuclear reactor penetrate surrounding slabs of material. This is a problem similar to that of the drunken walk but with the added dimension of up and down.

The impact point of a missile is also a random variable because of unpredictable changes in the guidance system resulting from difficulties with radar propagation and from electrical circuit "noise." The missile's path is simulated on the basis of the character of these random variables.

Dr. N. Metropolis, formerly of Los Alamos Scientific Laboratory and now at the University of Chicago, and Dr. S. Ulam of Los Alamos, are credited with coining the picturesque name, "Monte Carlo," for the method used to define the relationship between probability problems and mathematical equations.

Dr. Bauer's report on present uses of the Monte Carlo method, including a section on the new solution of elliptic partial differential equations with certain boundary conditions, appears in the *Journal of the Society of Industrial and Applied Mathematics* (Dec.).

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METEOROLOGY

# Winter Weather Due

➤ A "VIGOROUS circulation" covering most of the North American continent is bringing the northern U. S. its very wintry weather.

Jerome Namias, head of the U. S. Weather Bureau's extended forecast section, said the prevailing weather pattern was giving meteorologists an excellent example of the change from fall to winter weather. A very strong, upper level anti-cyclone (high pressure area) over the polar basin poured its cold air down into the U. S. at frequent and regular intervals.

The cold air sweeping southward from the Arctic was actually warmer than normal for polar regions during December. It flowed so fast, however, that by the time it had reached the northern U. S., it was much colder than normals there. This is because the air reached more southerly latitudes faster than the normals change.

The cold air masses pouring down from the Arctic hit western Canada first, then traveled across the Plains states and on to the East Coast. The icy journey from the Yukon down takes three days or a little more.

The pattern of a very high pressure area over the Arctic began showing up on pressure maps of the upper atmosphere about mid-November, Mr. Namias said, and then remained quite steady, showing all the signs that go with an early winter. The upper air pattern did not favor sinking, or subsidence, of the cold polar air, which would warm the air.

The jet stream's recent average position has been about 40 to 45 degrees north latitude, much farther north than last year, although it is expected to start shifting southward soon. The jet stream, influential in directing surface weather patterns, reaches its farthest north position usually in August or September, and its most southerly in February and early March.

The jet stream is a broad river of swift-flowing air found circling the earth some 30,000 feet above the earth's surface. Its meanderings and undulations resemble those taken by a river, but the jet stream makes a continuous circle of the Northern Hemisphere.

Science News Letter, December 27, 1958

MEDICINE

## Hyperthyroidism Helps X-Ray Treatment

➤ BY MAKING cancer victims hyperthyroids, physicians may have greater success in treating cancer.

Experiments with humans and rats and mice show a synthetic thyroid hormone can cut in half the X-ray dose needed for cancer treatment, two scientists report in *Nature*. (Dec. 13).

Of 400 animals given injections of the hormone triiodothyronine, after they received tumor transplants and then were treated with X-rays, 103 rats and mice survived. All animals had showed the symptoms of hyperthyroidism, such as irritability, large appetite, loss of weight and nervousness.

Among the survivors, tumors disappeared in four weeks although the radiation dose they received was half that given control, or normal thyroid, animals.

Similar success was reported with reducing the amount of radiation used in treating two human volunteers, Drs. Joseph A. Stein and Melvin L. Griem of the University of Chicago report.

"Regression of tumor masses was unequivocal at one-third the dose level (1,500 rads) at which such a response might ordinarily be expected," they say.

The hormone may make radiation more effective by stepping up the cells' metabolism and increasing their supply of oxygen.

Dr. Stein is now back at his post at Hebrew University's Hadassah Medical School, Jerusalem, Israel.

Science News Letter, December 27, 1958

PSYCHIATRY

## Russian Mental Patients Get "Tender Care"

➤ RUSSIAN mental patients are getting "tender, loving care," according to an American visitor to Moscow's largest mental hospital.

Robert H. Klein, mental hospital service consultant for the American Psychiatric Association, says the hospital staff members "seem genuinely dedicated to their jobs."

Mr. Klein expresses surprise at finding such "fine hospital care under a government which we have had been led to believe is completely uninterested in the individual except as he serves the state."

Reporting in the APA journal *Mental Hospitals* (Dec.), he wonders whether the Russians believe it is cheaper and more efficient to cure the mentally ill and return them to work. "Whatever the reasons," Mr. Klein says, "the prevailing philosophy at Kashenko (the Moscow hospital) is that its patients can either be cured or improved sufficiently to return home within a short time."

Tranquilizers have been used extensively in the past five years, he reports. Among other treatments, Mr. Klein found that special diets are employed in some cases because of a Russian belief that certain mental disorders are affected by nutrition.

A small number of patients are transferred, before discharge from Kashenko, to a sort of "half-way house" on the hospital grounds. Here the patients are given more freedom and wear normal clothes. There are no locked doors and facilities include a library, game room, and a comfortably furnished living room with radio and television. "Half-way house" patients receive the same types of treatment as in the hospital, but the proportion of staff to patients is much higher than in the hospital.

An average of 41 rubles a day per patient is spent at the 2,500-bed Kashenko. Based on various exchange rates, this may range from $1.36 to $10.25. Costs in the U. S. vary from less than $2 per day to more than $25.

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| PAGE | TITLE BEGINS | CORRECTIONS |
|---|---|---|
| 35 | Check Cancer | Col. 2, par. 3, line 1, 1:4 glucosaccharolactone *for* 1-4 gruosaccharolactone. |
| 36 | Russians Test | Col. 2, line 2, *after* of *read* a square inch. |
| 37 | Nuclear Physics | Subhead, line 3, neutron *for* neutrino. |
| 54 | International Cancer | Col. 3, line 17, *read* Other scientists attribute these findings to; last par., lines 3 and 4, pathogenic for parthenogenetic |
| 86 | Chromosomes Affected | Line 1, *after* dose *insert* rate |
| 105 | Parakeets Can | Line 1, excellent *for* full; lines 2 and 3, *read* against parrot fever by eating a new; *delete* par. 4. |
| 153 | Middle East | Par. 5, line 3, *after* mile *add* of arable land; Par. 6, line 2, *after* mile, *add* of arable land. |
| 199 | Test Missile | Col. 1, line 4, a total *for* an over-all |
| 211 | Put Radio | Col. 1 line 5, *after* first *insert* successful one; par. 5, line 2, at a pre-set time *for* in five hours. |
| 251 | U. S. Sends | Par. 1, lines 4 and 5, *read* broken through all past records for height, the U. S. |
| 265 | Scientist Studies | Par. 2, line 5, *after* Ohio *insert* State |
| 275 | Lighthouse-Like | Par. 3, lines 2 and 3, to *read* has a high magnification power was described . . . |
| 278 | Zinc Improves | Par. 2, line 1, *read* greater effectiveness suggests it might be possible |

ASTRONOMY

# Venus Appears Early

**A brilliant display of stars, with Mars easily visible and Venus beginning to show after sundown, can be seen in the January skies.**

By JAMES STOKLEY

➤ TO THE usual display of brilliant stars in the January evening sky there is added this month the planet Mars.

Although rapidly fading from its great brilliance at the time of its close approach in November, it is still brighter than any of the stars now visible, except one. The exception is Sirius, the dog star, seen to the southeast, in Canis Major, the great dog. Mars is in Aries, the ram, high in the southwest. After sunset, as darkness falls, Mars may be seen well up in the western sky. It remains visible until about 3:00 a.m.

The positions of Mars and Sirius, as well as the other stars now seen, are shown on the accompanying maps. These show the way the sky looks about ten o'clock your own kind of standard time, at the beginning of January, about nine o'clock in the middle and eight at the end.

## Brilliance in the Southeast

It is to the southeast that the most brilliant display of stars is found these evenings. In fact, there is no other part of the sky of similar area with so many bright ones. Sirius, as noted above, is the brightest. Above it, and to the right, stands Orion, the warrior, in which there are two stars of the first magnitude, Betelgeuse and Rigel. As depicted on the old star maps, with Orion's figure drawn around the stars, Betelgeuse was in one of his shoulders, and Rigel in his upraised left knee. The row of three stars between them represented his belt.

High in the south, just to the right of Orion, is Taurus, the bull, supposedly charging at the warrior.

In Taurus is the bright star called Aldebaran, distinctly red in color, which marks the animal's eye. In his shoulder, a little higher and to the right, is a cluster of fainter stars called the Pleiades. Six of these are visible to the naked eye, while many more may be seen through a telescope, a pair of binoculars, or even opera glasses.

Directly overhead (at the times for which these maps are prepared) is Auriga, the charioteer, in which stands the brilliant Capella. To the east of Auriga, you come to Gemini, the twins, with Pollux, of the first magnitude, and Castor, of the second. A little lower and farther south, about halfway between Pollux and Sirius, is Canis Minor, the lesser dog, with Procyon, another first magnitude star.

This brilliant array of stars forms an irregular pentagon surrounding Betelgeuse. Starting with Capella, and going clockwise, they are Aldebaran, Rigel, Sirius, Procyon and Pollux.

In addition, two other first magnitude stars are shown on the maps. One is Deneb, in Cygnus, the swan, low in the northwest. Because it is so near the horizon, much of its light is absorbed by the earth's atmosphere, and it appears much fainter than it does when higher in the sky. In the east is Leo, the lion, also dimmed by its low altitude, although not as much as Deneb.

Although Mars is the only planet shown on the maps, Venus is now beginning to enter the evening sky. It can be seen low in the southwest for about an hour after the sun goes down. Jupiter, in Libra, the scales, rises in the southeast about four hours ahead of the sun. It is followed, about two hours later, by Saturn, which is in Sagittarius, the archer. In addition, during the first few days of January, you may get a glimpse of Mercury, low in the southeast, just before the sun comes up.

A star may look bright for one of two reasons. It may really be very brilliant, as measured by candlepower, or it may look bright because it happens to be much closer than a more brilliant orb many times farther away.

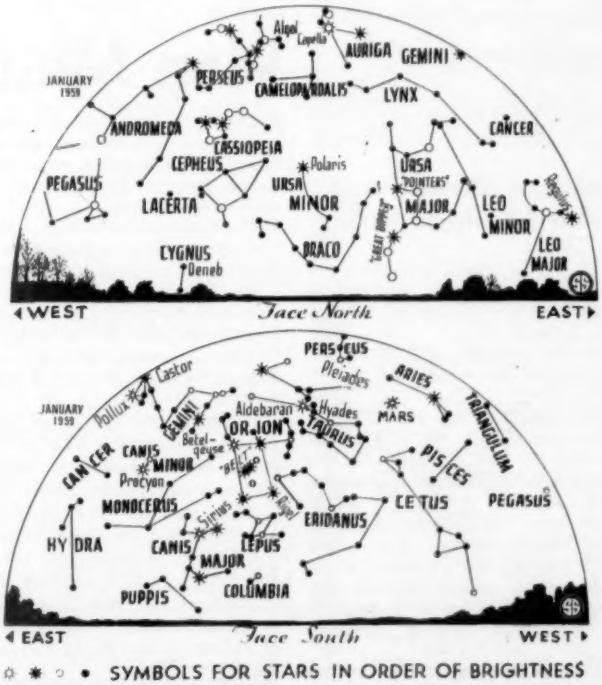
This principle is well-demonstrated by the array of bright stars in and around Orion. For example, take Sirius, which is the brightest star that we can see in the nighttime sky.

Astronomers express stellar brightness in magnitudes. A star of the first magnitude is 100 times as bright as one of the sixth, which is the faintest that can be seen with the naked eye. But Sirius is much brighter than the average star of the first magnitude, so it has been necessary to put it at magnitude minus 1.6. This is about 13 times as bright as Pollux, which is the faintest of the group we are considering. Rigel is in an intermediate position, about a sixth as bright as Sirius.

## Star Distances

Looking at the stars in the sky, their distances cannot be determined. The astronomer, however, has various methods whereby he can determine their distances. He has found that Rigel is about 63 times as far as Sirius. Light travels about 186,000 miles in a second. Coming from Sirius it reaches the earth in about 8.7 years, while that from Rigel takes about 543 years for the journey. If Rigel were moved in to the distance of Sirius, it would be about 4,600 times as bright; it would equal the moon in brilliance. The actual brightness of Sirius is about 27 times that of the sun (which is only 93,000,000 miles, or 8.3 light-minutes, away). Rigel, however, exceeds the sun some 18,000 tmes.

Among the other stars of Orion and its vicinity, the number of times they exceed the sun in brightness are as follows: Ca-



pella, 140; Betelgeuse, 2,900; Procyon, 5.6; Aldebaran, 100, and Pollux, 29.

Looking ahead on the 1959 celestial program, we find that there is a total eclipse of the sun—the first visible in any part of the United States since 1954—on Oct. 2. Even though the path crosses Massachusetts, it is rather doubtful how well it will be observed; it happens just after the sun has risen. Thus, the sky would have to be clear at sunrise, right down to the eastern horizon. If not, the eclipse will not be seen, from that part of the world at least.

From the New England coast, the track of the moon's shadow, in which the eclipse will be total, crosses the Atlantic Ocean and northern Africa, ending in the Indian Ocean south of Arabia at sunset. The locations in Africa are much more favorable than Massachusetts. Many astronomers will be located in Africa to make the observations that can be made most easily when the sun's bright disc is momentarily hidden by the moon.

### Celestial Time Table for January

| Jan. | EST | |
|---|---|---|
| 1 | 8:00 p.m. | Sun nearest earth for year, distance 91,344,000 miles. |
| 2 | 5:50 a.m. | Moon in last quarter. |
| 5 | 6:24 a.m. | Moon passes Jupiter. |
| | 3:00 p.m. | Moon nearest for month, distance 228,100 miles. |
| 9 | 12:34 a.m. | New moon. |
| | 4:23 a.m. | Algol (variable star in Perseus) at minimum brightness. |
| 12 | 1:11 a.m. | Algol at minimum. |
| 14 | 10:00 p.m. | Algol at minimum. |
| 16 | 4:26 p.m. | Moon in first quarter. |
| 17 | noon | Moon farthest, distance 251,200 miles. |
| | 6:50 p.m. | Algol at minimum. |
| 18 | 5:38 p.m. | Moon passes Mars. |
| 24 | 2:32 p.m. | Full moon. |
| 31 | 1:00 a.m. | Moon nearest, distance 230,100 miles. |
| | 2:06 p.m. | Moon in last quarter. |

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 27, 1958

EDUCATION

## Fall College Enrollment Rises 7th Straight Year

➤ AN ALL-TIME high enrollment of 3,258,556 full and part-time students in U.S. colleges and universities for the fall of 1958 has been reported.

This was the seventh consecutive year that new records were set for fall enrollments.

Enrollment for the fall of 1957 was 3,068,417 students. Thus, the 1958 enrollment exceeded the past year's by 190,139, U.S. Commissioner of Education Lawrence G. Derthick said.

The 1958 enrollees included 2,110,426 men and 1,148,130 women. The survey includes all degree-credit students. These are students whose current program consists principally or wholly of work normally creditable toward at least a bachelor's degree.

Science News Letter, December 27, 1958

BIOLOGY

# "Snails" Link With Past

➤ BELIEVED extinct for 300,000,000 years, four little snail-like creatures have been dredged up from the depths of the Pacific Ocean.

One of them is being flown to New York while scientists aboard the Columbia University research vessel "Vema" try to keep three of its fellows alive. Dr. J. Lamar Worzel, chief scientist on the "Vema," is bringing back the specimen together with pictures of the ocean floor where the animals were found.

The tiny Neopilina has been hailed as the oldest living representative of the primitive ancestors of a "really successful animal group"—the snails and chitons, and possibly the clams.

Only one other animal link with the prehistoric times can claim such a long past. This is the Lingula, a shell-bearing brachiopod living in the shallow waters off Japan.

Dr. John Imbrie, associate professor of geology at Columbia, described the snail-like Neopilina as about one and one-half inches long with a conical shell resembling a miniature dunce cap.

"This type of animal happens to be important biologically," Dr. Imbrie said, "because it is representative of a group known as the monoplacophora, called 'monoplacs,' a primitive group of snail-like creatures that began their history 500,000,000 years ago and until recently were thought to have become extinct 300,000,000 years ago.

"In their heyday they lived in shallow water along the shores and they are the ancestors of snails and 'chitons,' coat-of-mail snails that cling to rocks on the seashore and are quite common today . . . It might be said that the 'monoplacs' have been replaced by their more advanced descendants."

In the millions of years since the "monoplacs" were common they apparently retreated from the shores to the ocean floor more than 10,000 feet down.

The specimens found by the Columbia researchers were caught in nets at a depth of more than three miles. They were taken from an ocean trench some 200 miles west of Lima, Peru.

Although the animals experienced a temperature change of about 60 degrees (it is near freezing at the ocean depths), the change from pressure found three miles down to that found at the ocean surface is not expected to affect the specimens. Neopilina have no air sacs and so could not "explode" because of pressure changes.

The tiny sea creature has changed little from its ancestors of the Cambrian period.

Before this time animals that lived in the seas had no skeletons and we have no direct knowledge of what they looked like. With the "monoplacs," Dr. Imbrie explained, a few shell fish appeared and "for the first time we had living in the seas animals possessing skeletons which could be preserved."

The research vessel "Vema" left New York on Oct. 15 for a ten-month scientific voyage that is expected to provide a major contribution to the knowledge of biology, geology and oceanography of the South American area and of the South Atlantic Ocean.

Science News Letter, December 27, 1958

MEDICINE

# Plan Medical Year

➤ LOST IN the hubbub around his recent return from Moscow was Sen. Hubert Humphrey's agreement with Premier Khrushchev on international medical research cooperation.

The Soviet leader's offer to "help" implement the medical program put forth by the Minnesota Democrat was all but ignored.

Sen. Humphrey reported that during his eight-hour conference at the Kremlin, Mr. Khrushchev said, "I will help," in answer to various proposals and gave his "enthusiastic approval" to the overall program. The program includes:

1. "Full speed ahead" on plans for an International Medical Year on research and public health, possibly to begin in June 1961 and continue for 12 to 18 months.

2. An increase in the flow of medical data between East and West.

3. Greater personal contact between U.S. and Soviet medical scientists through correspondence and visits, and more participation in international meetings and in panels of experts of the World Health Organization.

4. Broadening of the medical provisions of the Lacy-Zarubin Agreement which covers U.S.-Soviet exchanges in the fields of science, technology and education.

5. Collaboration in intensified peri-natal research, covering the period from the 20th week of pregnacy to the first month after birth. (This was one of the proposals that elicited Premier Khrushchev's personal response to help.)

Most of Sen. Humphrey's program is included in a bill submitted by Sen. Lister Hill (D.,Ala.) near the end of the last Congress. The bill is expected to pass in the next session.

The International Medical Year would differ in character from the now-ending International Geophysical Year in that it would be a kind of "launching platform" for research in the years ahead. It would consist of broadening epidemiological reports throughout the world, a drive for raising national health research budgets, more international meetings, increases in fellowship awards and attempts to single out one or two diseases for eradication.

Science News Letter, December 27, 1958

# Books of the Week

**For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.**

BIBLE ANIMALS: Mammals of the Bible—Lulu Rumsey Wiley—*Vantage*, 479 p., illus., $4. Acquaints young people with bible passages referring to mammals.

BIBLIOGRAPHY AND INDEX OF GEOLOGY EXCLUSIVE OF NORTH AMERICA, Vol. 22—Marie Siegrist, Mary C. Grier and others—*Geological Soc. of Am.*, 771 p., $10. Covers literature on the geology of South America, Europe, Asia, Africa, Australia, Iceland and Atlantic and Pacific islands.

BIOLOGICAL MEMOIRS, Vol. XXXII—National Academy of Sciences—*Columbia Univ. Press.* 457 p., illus., $5. Biographies of late academicians, from astronomer Robert Grant Aitken to mathematician John von Neumann.

CLASSIFICATION AND INDEXING IN SCIENCE—B. C. Vickery, introd. by D. J. Foskett—*Academic*, 185 p., $5.50. Explores modern techniques of subject analysis, with chapter on application of classification in machine literature searching.

CLIMATOLOGY AND MICROCLIMATOLOGY: Proceedings of the Canberra Symposium—C. W. Thornthwaite and others—*UNESCO (Columbia Univ. Press)*, 355 p., illus., $11. Papers presented at symposium on arid zone climatology, held in Canberra, Australia, in October 1956.

COMPOSITION VERSUS PROPERTIES OF MICROCRYSTALLINE WAXES—W. P. Ridenour, I. J. Spilners and P. R. Templin—*Mellon Institute*, 11 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

CURRENT RESEARCH AND DEVELOPMENT IN SCIENTIFIC DOCUMENTATAION, No. 3—Madeline M. Berry and Barbara Haksteen—*Nat. Science Foundation (Govt. Printing Office)*, 76 p., paper, 30c. Descriptive report by the Office of Scientific Information, NSF.

THE CUSTOMS AND RELIGION OF THE CH'IANG—David Crockett Graham—*Smithsonian Inst.*, 114 p., illus., paper, $2. Describes conditions that prevailed up to the summer of 1948 when the writer last had contact with these people of western Szechwan, China.

CYTODIFFERENTIATION — Ernst Hadorn and others, Dorothea Rudnick, Ed.—*Univ. of Chicago Press*, 148 p., illus., $3.75. Record of research in developmental biology, a report from The Development Biology Conference Series, 1956, held under the auspices of the NAS-NRC.

EDUCATION ON THE AGING: A Selected Annotated Bibliography—Betty Arnett Ward—*Office of Education, HEW (Govt. Printing Offie)*, 145 p., paper, 60¢. Of service both to those in the field of adult education and the profession of gerontology.

ESSENTIALS OF HUMAN REPRODUCTION: Clinical Aspects, Normal and Abnormal—Joseph Thomas Velardo, Ed.—*Oxford Univ. Press*, 270 p., illus., $13.50. Textbook relating to the several aspects of human reproduction, written by leading specialists in clinical endocrinology.

FRANKFURT, COLOGNE, BERLIN — Hubert Charles Aleman—*Dorrance*, 204 p., illus., $3. On the history and postwar reconstruction of three German cities.

IMMUNOLOGY AND DEVELOPMENT — Mac V. Edds, Jr., Ed.—*Univ. of Chicago Press*, 59 p., $2.50. Report of Work Conference on Immunology and Development held at the Jackson Memorial Laboratory in 1956.

INFORMATION PLEASE ALMANAC 1959—Dan Golenpaul Associates, Eds—*Macmillan*, 960 p., illus., $2.50, paper $1.25. Features Willy Ley's 13-page report on space age news.

INSECT MIGRATION—C. B. Williams—*Macmillan*, 235 p., illus., $6. Insect migration is not a rare occurrence, but something quite normal in the lives of hundreds of species, occurring regularly at certain seasons in the same direction.

INSECTS OF HAWAII, Vol. 7: Macrolepidoptera —Elwood C. Zimmerman—*Univ. of Hawaii Press*, 542 p., illus., paper, $9.50. Enumeration of species and notes on their origin, distribution, hosts and parasites.

PERSPECTIVES ON CONSERVATION—Henry Jarrett, Ed.—*Johns Hopkins Press*, 260 p., $5. Expert opinion on resources problems, based on papers prepared for 1958 Resources for the Future Forum.

THE POLAR REGIONS IN THEIR RELATION TO HUMAN AFFAIRS — Laurence M. Gould — *Am. Geographical Soc.*, 54 p., illus., bathymetric map, $3.50. North Polar Lands include both the Arctic and the sub-Arctic whose southern limits are defined as the zone where average temperature is not higher than 50° F.

QUANTITATIVE CHEMICAL ANALYSIS—Gilbert H. Ayres—*Harper*, 726 p., illus., $7.50. College textbook covering the fundamental principles of elementary quantitative analysis, both theory and practice.

THE REPORTER'S TRADE—Joseph and Stewart Alsop—*Reynal*, 377 p., $5. Techniques of reporting in the era of atomic weapons and intercontinental missiles.

SCHIZOPHRENIA: A Review of the Syndrome—Leopold Bellak and Paul K. Benedict, Eds.—*Logos Press*, 1010 p., $14.75. Twenty-two authorities here review the status of clinical, therapeutic and diagnostic methods, drawn from over 4,000 contemporary studies.

SCIENCE IN SCHOOLS—W. H. Perkins, Ed.—*Butterworth & Co.* (Canada), 150 p., $3. Proceedings of a conference under the auspices of the British Association for the Advancement of Science, April 1958, London.

SELECTED BIBLIOGRAPHIES OF HYDROTHERMAL AND MAGNETIC MINERAL DEPOSITS—John Drew Ridge—*Geological Soc. of Am.*, 199 p., $3.75. For the geologist student, with indices listing deposits alphabetically, by minerals produced, by age of mineralization, and by their position in the Lindgren Classification.

TRANSISTORS: Theory and Practice—Rufus P. Turner—*Gernsback Library*, 2nd ed., 160 p., illus., paper, $2.95. Revision of 1954 edition.

Science News Letter, December 27, 1958

# Questions

**ASTRONOMY—What is the redshift? p. 403**

**BIOLOGY—Why is the discovery of living Neopilina important? p. 408.**

**MATHEMATICS—How does the "drunken walk problem" get its name? p. 406.**

**ROCKETS AND MISSILES—How much does the most recent U. S. satellite weigh? p. 405.**

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DEMOGRAPHY

# See Harm in Birth Rate

➤ INDIA'S explosive population growth could bring economic suicide to that country unless checked.

Human fertility is a potent force that will control India's destiny during the next 30 years, reports Robert C. Cook, director of the Population Reference Bureau, Inc.

"The leadership of Asia in the years ahead could go to that nation which first comes to grips with the dilemma of too-rapid population growth. No other advance would give so great an impetus to economic development," Mr. Cook said in the Bureau's journal, *Population Bulletin* (Dec.).

Analyzing a study on the high cost of high fertility in India, Mr. Cook concluded that the challenge for India and her people is also the challenge for Asia: Can the reproductive pattern of teeming millions be re-oriented to a small family within a generation?

The study was made by Princeton University's Office of Population Research with the support of the International Bank for Reconstruction and Development. It was conducted by Dr. Ansley J. Coale, associate professor of economics at Princeton, and Dr. Edgar M. Hoover, visiting professor of economics at Harvard University.

The urgent necessity for a rapid reduction in India's birth rate is supported by considerable economic evidence. If the present high rate continues and the death rate continues to decline, her population will almost double by 1986. Nearly 800,000,000 people would then live in an area about two-fifths the size of the United States.

Such a great increase would more than wipe out any economic gains made under India's present or future five-year plans. Sheer numbers of people will have thwarted the planned breakthrough to a better life.

However, if births should miraculously start to decline at once and continue downward to half their present level by 1981, India's high hopes for economic development might well be realized. Even though her population would increase from nearly 400,000,000 today to about 600,000,000 by 1986, a substantially higher percentage would be in the productive age levels of from 15 to 65.

**Science News Letter, December 27, 1958**

MEDICINE

# Plastic Mask Aids Surgery

➤ THE GAUZE mask that the surgeon wears in the operating room will soon be replaced in many hospitals by a new rubber plastic mask.

The new mask resembles a false face. It is much more effective against the spread of staphylococcal bacterial organisms, Dr. Claude R. Hitchcock of the Minneapolis General Hospital told SCIENCE SERVICE. Gauze masks allow about 120 times as much bacteria leakage as do the new plastic masks, he said.

Dr. Hitchcock and his partner in this project, Dr. Joseph Kaiser, also from General Hospital, began working on this project when staphylococcus outbreaks began in the surgery rooms. At one time, a Minneapolis hospital reported that one in every 33.5 operations resulted in the patient's suffering an infection after surgery. The rate is now one in every 56 operations, Dr. Hitchcock said.

The mask is expected to cost approximately $2. It is washable, comes in men's and women's sizes, has disposable side-filters to allow air to enter, and ties in the back the same as gauze masks.

Dr. Hitchcock said he advises that anyone entering the operating room should wear this mask to insure complete safety from bacterial organisms. This includes nurses and all visitors to the operating room, such as students.

Previously designed plastic masks had proved to be too uncomfortable, Dr. Hitchcock said. Comfort is a prime consideration when designing such masks, because it is not unusual for the surgeon to spend from six to eight hours a day in the operating room.

Results of tests with various mask combinations showed that single gauze masks allowed an average of 145 colonies of bacteria to filter through within a five-minute period of breathing. Double gauze masks, a combination used by some hospitals, allowed passage of an average of 43 colonies. An average of only 1.2 colonies got through the new plastic masks.

The masks will be available to physicians by Jan. 1, 1959. They are being produced by the Phelan Manufacturing Company of Minneapolis.

**Science News Letter, December 27, 1958**

ORNITHOLOGY

## Rare Warbler Caught By Camera's Eye

**See Front Cover**

➤ AN UNUSUAL harbinger of spring is this country's rarest breeding songbird, Bachman's Warbler, which was sighted on the outskirts of Charleston, S. Car., late this spring.

As the new year begins, even while winter is still with us, it is a happy reminder of the season to come.

The photograph on the cover of this week's SCIENCE NEWS LETTER is believed to be the first one ever taken of Bachman's Warbler. It was taken by John H. Dick. The bird is about four inches long, with an olive back, yellow breast and a jet black bib and cap.

**Science News Letter, December 27, 1958**

PHYSIOLOGY

## How Much Is Enough Related to Pain Intensity

➤ HOW MUCH pain you can take may be indicated by your ability to judge the size of a wooden block after you have held a large block in your hand for some time.

There appears to be a definite relationship between the two, three Boston researchers report.

"Satiability," the fact that after prolonged stimulation with a strong stimulus (large block), the size of another stimulus (second block) will appear smaller, may prove to be the body's mechanism for tolerating pain. Drs. Asenath Petrie, Walter Collins and Philip Solomon of the Harvard Medical School, Boston City Hospital and the Boston Sanatorium, respectively, described tests which support this theory in *Science* (Dec. 5).

Tests with some 28 adult males indicate that the individual who tolerates pain best is also the one most susceptible to satiation. An intermittent bigger wave of pain causes subsequent pain to be perceived as less intense, the scientists say.

In addition, they report, "Our findings provide some support for the hypothesis that he who tolerates sensory deprivation least is most susceptible to satiation."

Pain-tolerance was measured with an instrument that concentrates radiant heat on the skin. Tolerance of sensory deprivation was measured by nine volunteers who remained in a tank-type respirator.

Science News Letter, December 27, 1958

## RADIO

**Saturday, January 3, 1959, 1:35-1:50 P.M. EST**

**"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.**

**Dr. Fred Singer, professor of physics, University of Maryland, College Park, Md., will discuss "Radiation Menace in Space."**

AERONAUTICS

## New York to Miami Run Opens Domestic Jet Age

➤ THE FIRST domestic jet passenger service began on Dec. 10 when a four-engined Boeing 707 loaded to its capacity of 109 passengers and took off for Miami.

National Airlines said New York to Miami flight runs should take two hours and 15 minutes, with the northward flight being a bit shorter sometimes because of jet-stream assistance.

National borrowed from Pan American enough 707's to establish two flights a day each way in December. Three flights a day are scheduled for January. Planes will climb to about 32,000 feet for the trip, travel at 600 miles an hour, and carry 44 "super deluxe" seats at a $10 surcharge. Fares otherwise remain the same.

The 707's are replacing National's piston-engined DC-7's and Super Constellations, which made the run in three hours 50 minutes. Its own jets—Douglas DC-8's now on order—are expected to be delivered in January, 1960.

Science News Letter, December 27, 1958


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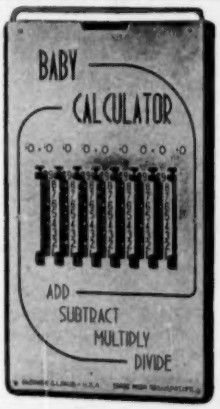


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Science News Letter, December 27, 1958

*FLUORESCENT LIGHT UNIT, less than one inch deep, is designed for limited-space applications, such as kitchen counters, mirrors and sinks. It can be installed completely out of the line of vision and is capable of illuminating dark work areas with 40 footcandles of light. Operation may be by push-type switch or starter.*

Science News Letter, December 27, 1958

*PRINTING MACHINE to mark cylindrical or uneven surfaces is operated simply and by hand. It enables one to mark 300 to 800 pieces an hour, the speed depending on the size and shape of the object to be imprinted. Even tiny imprints are sharp and long-lasting.*

Science News Letter, December 27, 1958

*MARBLE COLLECTOR for the youngsters is of transparent acetate and has a long tube with pistol grip handle at one end. A rubber tip at the other end is slotted to allow marbles to enter the tube when it is pressed down over them. Up to*

*30 marbles may be stored within the tube. Empty, the collector, shown in the photograph, resembles a long-barreled pistol or a short-barreled rifle.*

Science News Letter, December 27, 1958

*FIRST AID KITS designed for heavy-duty use feature unit-wrapped items. Available in sizes of 10, 16, 24 and 36 units, each kit has a facsimile index on the inside of the lid that shows exact location of all items and serves as an inventory control. Cases are made of 20-gauge steel.*

Science News Letter, December 27, 1958

*PAINT BLENDER measures out units of color as small as 1/16th ounce from 10 basic colorants. Colorants may be added to a package of basic white or to already prepared paint colors. The machine, which also produces colors in nearly all types of paint, enables the dealer to prepare custom colors within a short period of time.*

Science News Letter, December 27, 1958

*HOSE CLAMP for attaching hose to auto radiator and motor block can be applied with ordinary pliers. It consists of a single steel-spring wire shaped into a circle. Each end of the wire doubles back to the circle and overlaps to form a slot into which the circle may expand or contract. Circle is thus locked in place, preventing lateral spreading.*

Science News Letter, December 27, 1958

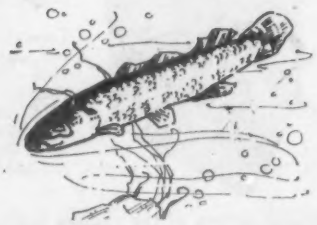
*MULTI-PURPOSE RULER has face with 12 one-inch divisions, each calibrated into 16ths. Each one-inch division is a separate hinged unit whose underside is further calibrated with decimal equivalents. Below the hinged units the base of the white plastic ruler contains additional fractional, decimal and percentage information.*

Science News Letter, December 27, 1958

# Nature Ramblings

By HORACE LOFTIN

## The Funny Finny Tribe



➤ WHEN IS a "fish" not a fish? This is not just a sly play on words by any means, but a serious question which has puzzled scientists for hundreds of years.

In the very old days, almost anything that swam, from a jellyfish to a great blue whale, was called a fish. Later, the term became a little more precise, with jellyfish, pollywogs, worms and the like being left out. A more modern definition is that those aquatic backboned animals which bear fins, either paired or unpaired, qualify for the title fish.

Today's fish experts, however, see many very different kinds of animals when they look at "fishes."

Looking over the broad group of fish-like animals, one very major difference immediately sets the lampreys and their kin apart from the others: the lack of jaws. Therefore, these were set aside as a very primitive group of backboned animals called the Agnatha, which is simply Greek for "jawless."

Another such look led to the separation of the sharks, rays and chimaeras into a class called the cartilaginous fishes, based on their lack of true bone and other distinctive features.

What remains after taking out these big groups are the "true fishes," or teleosts. Even then, we are omitting a whole array of extinct fishes or exotic forms such as the air-breathing lung fishes. True fishes range from the very primitive sturgeons and bow-fins (see illustration) through the herrings, suckers, minnows, perches and on to the highly specialized tunas.

There are at least 634 species of true fishes in the fresh waters of the United States. Throughout the world there are probably 25,000 distinct species known to science. The field is still wide open, even in the United States, for uncovering new ones.

Excepting the "lowest" forms like the sturgeons, the true fishes have skeletons which are largely or wholly comprised of bone. Lampreys, sharks and rays have a series of gill slits opening on the body surface; but the true fishes have just one gill slit, and this is covered by a bony plate for protection.

Another typical feature of true fishes is that the fins are generally supported by rays or "fin bones".

Science News Letter, December 27, 1958